

animals of which *Ph. Cookii* forms part, which he rejects because it is believed to be the native name of an animal not comprehended in that group. If all generic names (whether classical or barbarous) in the same predicament were to be rejected, how many new names would it not be necessary to introduce into the science in place of those given by the highest authorities! The other question has reference to my *Halmaturus Tasmanei*; and as Mr. Ogilby admits it is merely one of precedence, I leave it therefore on his own statement to the decision of those whom it may concern; observing only, that "previously" can in no way apply to the 28th of February in reference to the 10th of the same month in the same year, or to the 1st of May in reference to the 1st of April.

I regret to have been placed under the necessity of occupying so much of your valuable space on questions of little more than personal importance. I trust, however, that I have treated them without any exhibition of personal feeling, and it would give me sincere pleasure to find them met in a similar spirit.

Yours most sincerely,

JOHN EDWARD GRAY.

British Museum, 10th May, 1838.

XXXIV.—*Prodromus of a Monograph of the Radiata and Echinodermata*. By LOUIS AGASSIZ, D.M.*

[Continued from p. 43.]

I.

THE order *Fistulides* or the *Holothuriæ* contains but one family, which corresponds to the genus *Holothuria* of Linnæus, with the exception of those species which did not rightly belong there. Their body is soft, contractile, more or less elongated, beset with tentacula similar to those of the ambulacra of the *Echini*, and are sometimes arranged as regularly as in the latter. The mouth is situated at the anterior extremity of the body, surrounded by appendices, more or less ramified and fringed; the anus is placed towards the opposite extremity. Notwithstanding the elongated form of these animals, by which they more or less resemble worms, we perceive in the interior and even at the surface the radiated disposition of certain parts of their body, which are arranged in vertical bands, extending from the mouth to the posterior extremity. The numerous species which this division now contains renders it necessary to establish several genera, which

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are however not yet well enough based to be admitted without reserve. Several of them I have not had occasion to examine myself.

1. SYNAPTA, Esch. (*Fistularia*, De Bl.—*Tiedemannia*, Leuck.—*Holothuria*, De Bl. sect. D.)—Body vermiform, presenting no difference between the upper and under surface; epidermis delicate; the mouth surrounded by large pinnatifid tentacula. Tubercles, for the most part crooked, and serve as feet, although the animal is not entirely destitute of vascular tubes.

S. Beselii, Jæg.—*S. oceanica*, Less.—*S. mammillosa*, Esch.—*S. vittata*, Jæg.—(*Tiedemannia vitt.*, Leuck.)—*S. reciprocans*, Jæg.—(*Fistularia*, recipr., *Forsk.*—*Holothuria glutinosa*, *Lam.*)—*S. maculata*, Jæg. (*Hol. mac.*, *Cham.*)—*S. radiosa*, Jæg. (*Hol. rad.*, *Regn.*)—*S. inhærens*, Wieg. (*Hol. inh.*, *Mull.*)

2. CHIRODOTA, Esch.—Epidermis thin, rather thicker however than in *Synapta*, beset with a small number of feet or merely of retractile mammillæ. Tentacula digitate.

Ch. purpurea, Less.—*Ch. lumbricus*, Esch.—*Ch. verrucosa*, Esch.—*Ch. discolor*, Esch.

3. THYONE, Oken. (*Mulleria*, *Flem.*) This genus differs from the preceding solely in having the entire body covered with retractile papillæ.

Th. papillosa (*H. papill.*, *Mull.*)—*Th. fusus* (*H. fus.*, *Mull.*)—*Th. impatiens* (*B. imp.*, *Forsk.*)—*Th. maculata* (*Hol. mac.*, *Le S.*)—*Th. Briareus* (*Hol. Br.*, *Le S.*)—*Th. lapidifera* (*H. lapid.*, *Le S.*)—*Th. peruviana* (*H. peruv.*, *Le S.*)

4. TREPANG, Jæg.—Body subcylindrical; mouth anterior, surrounded by ten to twenty tentacula in a peltate head; feet confined to the belly. This genus is doubtful, and ought probably to be united to the *Holothuriæ* properly so called.

T. edulis (*Hol.edul.*, *Less.*)—*T. ananas*, Jæg.

5. HOLOTHURIA, Linn.; De Bl. sect. B. (*Fistularia*, *Lam.*)—Body subcylindrical, anus rounded; mouth subinferior. Retractable tubes developed, especially under the belly.

H. tubulosa, Linn.—*H. columnæ*, Cuv.—*H. maxima*, *Forsk.*—*H. elegans*, *Mull.*—*H. Forskalii*, *Delle Ch.*—*H. Petagnii*, *Delle Ch.*—*H. Sanctorii*, *Delle Ch.*—*H. Cavolinii*, *Delle Ch.*—*H. Polii*, *Delle Ch.*—*H. Stellati*, *Delle Ch.*—*H. Dismarii*, *Cuv.*—*H. appendiculata*, *De Bl.*—*H. radackensis*, *Cham.*—*H. brunnea*, *Cham.*—*H. agglutinata*, *Le S.*—*H. umbrina*, *Rupp. et Leuk.*—*H. quadrangularis*, *Less.*—*H. fusco-cinerea*, *Jæg.*—*H. atra*, *Jæg.*—*H. fusco-punctata*, *Jæg.*—*H. lilla*, *Less.*—*H. scabra*, *Jæg.*—*H. monacaria*, *Less.*

6. MULLERIA, Jæg.—Back convex; belly flat; skin coriaceous; twenty tentacula peltate and disposed in two series round the mouth;

five teeth surrounding the anus, to which are attached the longitudinal muscles. In other respects it resembles *Holothuria*.

M. echinites, Jæg.—*M. Lecanora*, Jæg.

7. BOHADSCHIA, Jæg.—Differs from the genus *Mulleria* by the star-like form of the anus. This genus otherwise approaches closely to *Holothuria*.

B. marmorata, Jæg.—*B. ocellata*, Jæg.—*B. Argus*, Jæg.—*B. lineolata*, Jæg.—*B. alboguttata*, Jæg.

8. CUVIERIA, Peron.—Inferior surface flat and soft, furnished with a great number of feet; superior surface inflated, supported by bony scales, pierced in front by a starlike orifice, which is the mouth, and from which the tentacula proceed, on the under side by a round aperture, which is the anus.

C. Squammata (Hol. Squammata, Mull.).—*C. Cuvieri*, Jæg.

9. PSOLUS, Oken.—Back convex; belly flat; all the feet situated in the middle of the under part of the body; tentacula ramified, simple, not peltate. When the animal crawls, it raises its two extremities where the head and anus are situated, which are more contractile than the middle part, especially the anal extremity.

Ps. Phantopus (Hol. Ph., Linn.).—*Ps. appendiculatus* (Hol. appen., De Bl.).—*Ps. Timama* (Hol. Tim., Less.).

10. PENTACTA, Goldf. (*Cucumaria*, Cuv. et Jæg.)—Body cylindrical or oval-oblong; pedicules disposed in five series; tentacula pinnate or branchy.

P. crocea (Hol. croc., Less.).—*P. Pentactes* (Hol. Pent., Mull.).—*P. Gærtneri* (Hol. Gært., De Bl.).—*P. frondosa* (H. frond., Gun.).—*P. Dololium* (H. Dol., Pall.).—*P. tentaculata* (Hol. tent., Forst.).—*P. lævis* (Hol. lævis, Fabr.).—*P. minuta* (Hol. min., Fabr.).—*P. pellucida* (Hol. pellucida, Mull.).

11. MINYAS, Cuv.—Body spheroidal, opened at both extremities, grooved like a melon at the two sides, which extend from the anus to the mouth, and which are formed of solid and corneous papillæ; mouth surrounded by three series of short, vermicular, and rounded tentacula. This genus and the preceding connect the Holothuriæ with the Echinides.

M. cyanea, Cuv. (*M. cœrulea*, Less.)

II.

The order of the Echinides is characterized by a solid shell, spheroidal, composed of adherent plates, and covered with moveable spines; all of them have a distinct mouth and anus. I divide them into three natural families, which are the *Sputangi*, the *Clypeastres*, and the *Cidarites*.

I. The *Spatangi* have the body more or less elongated and gibbous ; their mouth is furnished with jaws, and is placed towards the anterior extremity, and the anus towards the posterior extremity, sometimes on the upper surface of the disc, sometimes on the lower. Their shell is thin, covered with small tubercles, very numerous, among which are observed some larger ones, which are scattered and often perforated like those of the *Cidarites*. The spines are setaceous, often compressed, and of unequal size. The anterior ambulacrum is generally less developed than the rest ; they form round the mouth grooves, where the holes are larger and whence proceed ramified tentacula like those of the *Holothuriæ*. There are only four oviducal plates, which are very distinct.

1. DISASTER, Ag. (*Spatangus*, *Ananchytes*, et *Nucleolites*, auct.) The odd ambulacrum and those of the anterior pair converge at a point situated at a greater or less distance from the point of junction of the two posterior ambulacra. All the species of this genus are fossils of the chalk or of the jura.

D. bicordatus, Ag. (*Spatangus* bic., *Goldf.*)—*D. ellipticus*, Ag. (*Ananchytes* ellipt., *Lam.*)—*D. excentricus*, Ag. (*Nucleolites* excentr., *Munst.*)—*D. canaliculatus*, Ag. (*Nucleo. canal.*, *Munst.*)—*D. granulosus*, Ag. (*Nucleo. granul. Munst.*)—*D. capistratus*, Ag. (*Spat. capistr.*, *Goldf.*)—*D. carinatus*, Ag. (*Spat. carin.*, *Goldf.*)—*D. ovalis*, Ag. (*Spat. oval.*, *Park.*)—*D. analis*, Ag.—*D. ringens*, Ag. (these two latter from the Swiss Jura.)

2. HOLASTER, Ag. (*Spatangus*, auct.).—Disc heart-shaped ; ambulacra converging uniformly towards a point at the summit ; anus superior. All fossils, especially of the chalk.

H. granulosus, Ag. (*Spat. gran.*, *Goldf.*)—*H. hemisphæricus*, Ag. (*Spat. hemisph.*, *Phil.*)—*H. lævis*, Ag. (*Spat. læv.*, *Deluc.*)—*H. nodulosus*, Ag. (*Spat. nod.*, *Dolf.*)—*H. planus*, Ag. (*Spat. plan.*, *Mant.*)—*H. complanatus*, Ag. (*Spat. compl.*, *De Bl.*)—*H. intermedius*, Ag. (*Spat. interm.*, *Munst.*)—*H. subglobosus*, Ag. (*Spat. subgl.*, *Leske.*)—*H. suborbicularis*, Ag. (*Spat. suborb.*, *Defr.*)—*H. truncatus*, Ag. (*Spat. trunc.*, *Goldf.*)

3. ANANCHYTES, Lam. and De Bl. (*Echinocorys*, Breyn. and Gray ; *Galea* and *Galeola*, Klein.)—Disc oval, no groove along the anterior ambulacrum ; anus oblong, placed longitudinally ; ambulacra converging uniformly towards the summit, where the double pores are very close, while they are widely apart at the circumference. All the species are fossils from the chalk ; they have been too much multiplied from mere differences of age.

A. ovata, Lam.—*A. gibba*, Lam.—*A. hemisphærica*, Al. Br.—*A. pustulosa*, Lam. is but the inner cast of *A. ovata*.—*A. quadriradiata*, Leske, is merely a monstrosity.

4. HEMIPNEUSTES, Ag. (*Spatangus*, auct.)—Disc heart-shaped,

anterior ambulacrum formed of minute equal pores; the lateral ambulacra formed each of two series of double pores, differing among themselves, the posterior series being much more marked than the anterior. One species, from the chalk.

H. radiatus, Ag. (*Spatangus rad.*, Lam.)

5. MICRASTER (*Spatangus*, auct.; *Brissoides*, Klein.; *Amygdala* and *Ovum*, V. Ph.).—Dorsal portion of the ambulacra highly developed and rather starlike; disc heart-shaped. The most part of the species are fossils from the chalk; there are some tertiary, and two living.

M. Amygdala, Ag. (Spat. Amygd., Goldf.)—*M. Bucklandii*, Ag. (Spat. Buckl., Goldf.)—*M. Bucardium*, Ag. (Spat. Bucard., Goldf.)—*M. Bufo*, Ag. (Spat. Bufo, Al. Br.)—*M. Cor. anguinum*, Ag. (Spat. Cor. Ang., Lam.)—*M. Cor. testudinarium*, Ag. (Spat. Cor. test., Goldf.)—*M. gibbus*, Ag. (Spat. gib., Lam.)—*M. Goldfusii*, Ag. (Spat. lacun., Goldf., non Gmel.)—*M. Prunella*, Ag. (Spat. Prun., Lam.)—*M. acuminatus*, Ag. (Spat. acum., Goldf.)—*M. suborbicularis*, Ag. (Spat. suborb., Munst.)—*M. canaliferus*, Ag. (Spat. canal., Lam.)—*M. lacunosus*, Ag. (Spat. lacun., Gmel., non Goldf.)

6. SPATANGUS, Klein and Gray. (*Echinospatangus*, Breyn.)—Disc heart-shaped; with a large, deep, anterior dorsal groove; the ambulacra of this groove are formed of minute equal pores, which, near the summit and at the circumference, present the form of a star. Besides the small spines, which are smooth on the back, there are some larger ones, but very slender. There are some fossil species from the chalk and tertiary deposits, and several living species.

Sp. ornatus, Al. Br.—*Sp. Desmarestii*, Munst.—*Sp. Hoffmanni*, Goldf.—*Sp. purpureus*, Leske.—*Sp. meridionalis*, Riss.—*Sp. ovatus*, Leske.—*Sp. Cruz Andreae*, Lam.—*Sp. planulatus*, Lam.

7. AMPHIDETUS, Ag. (*Echinocardium*, V. Ph. and Gr.—*Spatangus*, De Blainv., Sect. A.)—Disc heart-shaped, anterior dorsal groove deep, in which lies the odd ambulacrum, which is formed of minute pores, and is prolonged between the anterior ambulacra. The series of double pores which form the four ambulacral pairs are at a distance from each other towards the summit of the disc, and gradually approximate towards the periphery in the form of a star. The spines are very remarkable, the larger being arched and spatuliform at their extremity, the others are small and smooth. I know but of one fossil species from the chalk, and two living.

A. Goldfusii, Ag. (Spat. arcuarius, Goldf., non Lam.)—*A. Sebæ*, Ag. (*Echinocardium Sebæ*, Gr.)—*A. pusillus*, Ag. (Spat. pusillus, Leske.)

8. BRISSUS, Kl. and Gr. (*Echinobrissus*, Breyn.—*Nuces*, V. Ph.—*Spatangus*, De Blainv., Sect. D.)—No anterior dorsal groove; odd

ambulacrum scarcely perceptible; the four ambulacral pairs depressed, forming at the summit of the disc a kind of cross, circumscribed by a sinuous line without tubercles or spines. I am not acquainted with any fossil species.

B. pectoralis, Ag. (*Spatangus Pect.*, Lam.)—*B. carinatus*, Leske.—*B. columbaris*, Lam.—*B. Scillæ*, Ag. (*Echinus Spatangus Scilla.*)—*B. unicolor*, Leske.—*B. ventricosus*, Leske.—*B. compressus*, Ag. (*Spat. compr.*, Lam.)—*B. sternalis*, Ag. (*Spat. stern.*, Lam.)

9. SCHIZASTER, Ag. (*Echinocardium*, V. Ph. and Gr.—*Spatangus*, de Bl. Sect. B.)—Disc heart-shaped, very much raised posteriorly; anterior dorsal groove long and deep; four other grooves at the dorsal summit deep and narrow, in which the ambulacra are hidden. One fossil species, and one living.

Sch. Atropos, Ag. (*Spat. Atr.*, Lam.)—*Sch. Studeri*, Ag. (from the Italian tertiary.)

II. The *Clypeastres* occupy the intermediate place between the *Spatangi* and the *Cidarites*; their form is most generally circular. The mouth is central or subcentral; but the anus is more or less approximated to the periphery, and is found sometimes at the upper surface, sometimes at the under surface of the disc.

1. CATOPYGUS, Ag. (*Nucleolites*, auct.)—Disc oval; ambulacra converging uniformly towards the summit; anus at the posterior surface. All the species are fossil, from the jura, chalk, and tertiary deposits.

C. semi-globosus, Ag. (*Nucleolites semi-gl.*, Munst.)—*C. carinatus*, Ag. (*Nucl. carin.*, Goldf.)—*C. castanea*, Ag. (*Nucl. cast.*, Al. Br.)—*C. pyriformis*, Ag. (*Nucl. pyrif.*, Goldf.)—*C. ovulum*, Ag. (*Nucl. ov.*, Lam.)—*C. depressus*, Ag. (*Nucl. depr.*, Al. Br.)—*C. subcarinatus*, Ag. (*Nucl. subcar.*, Goldf.)—*C. obovatus*, Ag.

2. PYGASTER, Ag. (*Nucleolites* and *Clypeus*, auct.)—Disc circular; ambulacra converging uniformly towards the summit; orifice of the anus large at the upper surface of the disc. Species all fossil, from the jura and chalk.

P. semisulcatus, Ag. (*Clyp. semisul.*, Phil.)—*P. depressus*, Ag. (*Nucl. depr.*, Munst.)

3. GALERITES, Lam. (*Conulus*, Klein.—*Echinochonus*, De Bl.)—Disc circular; ambulacra narrow, pierced with pores rather distant from one another, converging uniformly towards the summit; mouth central, anus marginal and inferior. Species all fossil, from the chalk. This genus approaches more to the *Nucleolites* and *Echinoneæ* than to the true *Echini*.

G. vulgaris, Lam.—*G. abbreviata*, Lam.—*G. subrotunda*, Mant.—(*G. quadrifasciata*, Burg., and *sexfasciata*, Defr., are monstrosities.)

4. DISCOIDEA, Kl. and Gr. (*Conulus*, Leske.—*Echinodiscites*, V. Ph.—*Galerites*, Lam.)—Differs from the *Galerites* by the large ambulacra pierced with small pores at very short distances from one another. All the species are fossil, from the jura and chalk.

D. depressa, Ag. (*Galer. depr.*, Lam.)—*D. speciosa*, Ag. (*Gal. spec.*, *Munst.*)—*D. albo-galera*, Ag. (*Conulus albo-gal.*, Leske.)—*D. canaliculata*, Ag. (*Gal. canal.*, Goldf.)—*D. rotula*, Ag. (*Gal. rot.*, *Al. Br.*)—*D. rotularis*, Kl. (*Gal. rotul.*, Lam.)—*D. macropyga*, Ag.

5. CLYPEUS, Kl. (*Echinoclypeus*, De Bl.—*Echinosisimus*, V. Ph.—*Galerites*, Lam.—*Nucleolites*, De Fr.)—Disc circular, more or less flattened; ambulacra converging towards the apex and towards the periphery of the disc; anus superior and marginal. All the species are fossil, from the jura, chalk, and tertiary deposits.

Cl. sinuatus, Park.—*Cl. emarginatus*, Phil.—*Cl. patella*, Ag. (*Gal. pat.*, Lam.)—*Cl. orbicularis*, Phil.—*Cl. Sowerbii*, Ag. (*Nucleolites Sow.*, Defr.)—*Cl. conoideus*, Ag. (*Echinoclyp. conoid.*, Leske.)—*Cl. hemisphæricus*, Ag. (*Echinoclyp. hemisph.*, Leske.)—*Cl. testudinarius*, Ag. (*Nucl. testud.*, *Munst.*)—*Cl. scutella*, Ag. (*Nucl. scut.*, Goldf.)

6. NUCLEOLITES, Lam. (*Echinobrissus*, Breyn.—*Clypeus*, Phil.)—Disc oval or heart-shaped; ambulacra more prominent at the apex than at the periphery; they however do not form a petaloid star, as in the genus *Clypeus*. All are fossils from the jura, chalk, or tertiary deposits.

N. scutata, Lam.—*N. clunicularis*, Ag. (*Clyp. clunic.*, *Smith.*)—*N. dimidiata*, Ag. (*Clyp. dimid.*, *Phil.*)—*N. planata*, Rœm.—*N. cordata*, Goldf.—*N. lacunosa*, Goldf.—*N. scorbiculata*, Goldf.—*N. Olfersii*, Ag.—*N. grignonensis*, Defr.

7. CASSIDULUS, Lam. (*Nucleolites*, auct.)—Disc oval; ambulacra petaloid, anus between the summit and posterior margin. All are fossils from the chalk and tertiary deposits.

C. Lapis cancri, Lam.—*C. patellaris*, Ag. (*Nucl. patell.*, Goldf.)—*C. complanatus*, Lam.

8. FIBULARIA, Lam.—(*Echinocyamus*, Leske and Gr.—*Echinoneus*, Goldf.)—Shell spheroidal; circumference oval or subcircular; ambulacra petaloid; anus between the posterior margin and the mouth. The species are fossils of the chalk and tertiary deposits, and some recent.

F. placenta, Ag. (*Echinon. plac.*, Goldf.)—*F. subglobosa*, Ag. (*Echinon. subgl.*, Goldf.)—*F. ovata*, Ag. (*Echinon. ovat.*, *Munst.*)—*F. scutata*, Ag.

(Echinon. scut., *Munst.*)—*F. suffolciensis*, Leach.—*F. craniolaris*, Linn., Gmel.—*F. ovulum*, Lam.

9. ECHINONEUS, V. Phils. and Lam. (*Echinanaus*, Kœn.—*Echinoconus*, Breyn.)—Disc oval, more or less flattened; ambulacra converging uniformly towards the summit; anus between the mouth and posterior margin. All the species are living.

E. cyclostomus, Lam.—*E. semilunaris*, Lam.—*E. gibbosus*, Lam.

10. ECHINOLAMPAS, Gray. (*Echinanthus*, Leske.—*Clypeaster* and *Galerites*, Lam.)—Disc oval or circular; front margin more or less sloped; ambulacra very large at the summit, where they form a star, the rays of which touch one another, but which gradually become more narrow towards the periphery; anus marginal, inferior. There are some fossil species from the jura, the chalk, and tertiary deposits, and one living.

E. pentagonalis, Ag. (Clyp. pentag., *Phil.*)—*E. fornicatus*, Ag. (Clyp. forn., *Goldf.*)—*E. globosus*, Ag. (Gal. glob., *Defr.*)—*E. Kœnigii*, Gr.—*E. Leskei*, Ag. (Clyp. Lesk., *Goldf.*)—*E. Montmollini*, Ag.—*E. productus*, Ag.—*E. minor*, Ag.—*E. affinis*, Ag. (Clyp. aff., *Goldf.*)—*E. Bouei*, Ag. (Clyp. Bouei, *Munst.*)—*E. Brongniarti*, Ag. (Clyp. Brongn., *Munst.*)—*E. conoideus*, Ag. (Clyp. conoid., *Goldf.*)—*E. Cuvieri*, Ag. (Clyp. Cuv., *Munst.*)—*E. ellipticus*, Ag. (Clyp. ellipt., *Munst.*)—*E. hemisphæricus*, Ag. (Clyp. hemisph., *Lam.*)—*E. Kleinii*, Ag. (Clyp. Klein., *Goldf.*)—*E. Linkii*, Ag. (Clyp. Link., *Goldf.*)—*E. politus*, Ag. (Clyp. poll., *Lam.*)—*E. stelliferus*, Ag. (Clyp. stellif., *Lam.*)—*E. subcylindricus*, Ag. (Clyp. subcyl., *Munst.*)—*E. trilobus*, Ag. (Clyp. tril., *Defr.*)—*E. orientalis*, Gr.

11. CLYPEASTER, Lam. (*Echinanthus*, Breyn. and Gr.)—*Echinodorum* and *Echinodiscus*, V. Phils.—(*Lagana*, Gr. and De Bl.)—Disc oval or subpentangular; ambulacra forming at the summit a large star, the rays of which are rounded at their extremity; anus inferior and marginal. The internal cavity is divided into chambers by vertical pillars. The shell is very thick. There are several fossil species from the tertiary deposits, and some living.

Cl. marginatus, Lam.—*Cl. altus*, Lam.—*Cl. Gaymardi*, Al. Br.—*Cl. Richardi*, Desm.—*Cl. rosaceus*, Lam.—*Cl. subdepressus*, Ag. (*Echinanthus* subdepr., Gr.)—*Cl. ambigenus*, De Bl.—*Cl. scutiformis*, Lam.

12. ECHINARACHNIUS, Leske and Gr. (*Arachnoides*, Kl.—*Echinodiscus* and *Lagana*, De Bl.—*Scutella*, Lam.)—Disc circular or subangular; ambulacra as in *Clypeaster*, from which this genus especially differs by the much flattened form of the shell, and by its thin margins; anus marginal. There is one fossil species from the tertiary beds, and several living.

E. lenticularis, Gr.—*E. placenta*, Gr. (Scut. plac., *Lam.*)—*E. Parma*, Gr.

(Scut. Parm., Lam.)—*E. placunarius*, Ag. (Scut. placun., Lam.)—*E. latissimus*, Ag. (Scut. latissima, Lam.)—*E. Rumphii*, Ag. (Echinodis. Rumph., De Bl.)

13. SCUTELLA, Lam. and De Bl. (*Echinodiscus*, Leske and Gr.—*Mellita* and *Rotula*, Kl.—*Lagana*, De Bl.)—Shell flattened, circular, margins thin; ambulacra as in *Clypeaster*, but in proportion larger; anus inferior. The species are very numerous, some fossils of the tertiary formation, and some living.

Sc. altavillensis, Defr.—*Sc. gibberula*, M. de S.—*Sc. hispanica*, Defr.—*Sc. nummularia*, Defr.—*Sc. occianta*, Defr.—*Sc. striatula*, M. de S.—*Sc. subrotunda*, Lam.—*Sc. porpita*, Bory.—*Sc. orbicularis*, Lam.—*Sc. ovalis*, Ag. (Lag. oval., Brug.)—*Sc. integra*, Brug.—*Sc. inaurita*, De Bl.—*Sc. aurita*, De Bl.—*Sc. dentata*, Lam.—*Sc. radiata*, Seba.—*Sc. digitata*, Lam.—*Sc. octodactyla*, De Bl.—*Sc. hexapora*, De Bl.—*Sc. pentapora*, De Bl.—*Sc. bipora*, Lam.—*Sc. tetrapora*, De Bl.—*Sc. emarginata*, Lam.

III. The *Cidarites* constitute a family, the most prominent character of which is the spheroidal form of the shell, which is beset with two kinds of spines; the first larger, situated on large mammillæ; the others smaller, surrounding the base of the first, or covering the ambulacra. The mouth is central, at the inferior surface of the disc; the anus, which is diametrically opposite to it, is situated at the summit of the disc, and opens between the small laminæ surrounding it, opposite and sometimes very near to the posterior ambulacral space.

1. CIDARIS, Lam. and Auct.—Ambulacra narrow, covered with small, compressed spines, interambulacral spaces large, each of their plates being surmounted with one large perforated tubercle bearing a great spine, around which are several small ones. There are a great number of species, fossils from the jura, chalk, and tertiary deposits, as also many living ones.

C. Blumenbachii, Munst.—*C. Buchii*, Munst.—*C. coronata*, Goldf.—*C. crenularis*, Lam.—*C. elegans*, Munst.—*C. florigemma*, Phil. (*C. elongata*, Rœm.)—*C. glandifera*, Goldf.—*C. marginata*, Goldf.—*C. maxima*, Munst.—*C. monilifera*, Goldf.—*C. muricata*, Rœm.—*C. nobilis*, Munst.—*C. propinqua*, Munst.—*C. Schmidelii*, Munst.—*C. spinulosa*, Rœm.—*C. regalis*, Goldf.—*C. clavigera*, Kœn.—*C. corollaris*, Mant.—*C. cretosa*, Mant.—*C. clunifera*, Ag.—*C. vesiculosa*, Goldf.—*C. limaria*, Bronn.—*C. discus*, Bronn.—*C. rosaria*, Bronn.—*C. serraria*, Bronn.—*C. hystrix*, Lam.—*C. baculosa*, Lam.—*C. tribuloides*, Lam.—*C. verticillata*, Lam.—*C. tubaria*, Lam.—*C. bispinosa*, Lam.—*C. annulifera*, Lam.—*C. metularia*, Lam.—*C. stellulifera*, Bory.—*C. imperialis*, Lam.—*C. granioides*, Lam.—*C. pistillaris*, Lam.

2. DIADEMA, Gray. (*Cidarites*, Lam.)—Shell more or less flattened; ambulacra large, converging uniformly towards the summit. The

spines are often tubular. The tubercles of the ambulacral plates, although equally perforated, are smaller and more numerous than in *Cidaritis*. There are fossil species from the jura and chalk, and many recent.

D. Bechei, Ag. (*Cid. Bech.*, Broder.)—*D. subangulare*, Ag. (*Cidarit. subang.*, Goldf.)—*D. vagans*, Ag. (*Cidaritis vag.*, Phil.)—*D. mammillanum*, Ag. (*Cidarit. mam.*, Rœm.)—*D. hemisphæricum*, Ag. (Jura.)—*D. transversum*, Ag. (Jura.)—*D. variolare*, Ag. (*Cidarit. variol.*, Al. Br.)—*D. granulolum*, Ag. (*Cidarit. granul.*, Goldf.)—*D. ornatum*, Ag. (*Cidarit. orn.*, Goldf.)—*D. rotulare*, Ag.—*D. setosum*, Gr.—*D. calamarium*, Gr.—*D. spinosissimum*, Ag. (*Cidarit. spinos.*, Lam.)—*D. subulare*, Ag. (*Cidarit. subul.*, Lam.)—*D. pulvinatum*, Ag. (*Cidarit. pulvin.*, Lam.)

3. ASTROPYGA, Gray. (*Cidarites*, Lam.)—Shell flattened; ambulacra large, and converging uniformly towards the summit; oviducal plates very long, lanceolate; several vertical series of spines on the interambulacral spaces. One living species only.

A. radiata, Gray.

4. SALENTA, Gr. (*Cidarites*, auct.)—This genus resembles that of *Cidaritis* by the disposition of the ambulacral plates, but they bear a large mammilla, whose summit is not perforated. Around the anus, instead of small moveable laminae, there are large scutelli (écussons) articulated at their margins. The oviducal plates are also very large. All the species are fossils, from the jura, or chalk.

S. Hoffmanni, Ag. (*Cidarit. Hoffm.*, Rœm.)—*S. hemisphærica*, Ag. (*Cidarit. hemisph.*, Rœm.)—*S. scutigera*, Gr.—*S. peltata*, Ag.

5. ECHINOMETRA, Breyn., V. Phels., and Gr. (*Echinus*, auct.)—Shell oval transversely and obliquely to the longitudinal axis, more or less flattened; large tubercles on the interambulacral spaces, bearing spines of very varied forms. Mr. Gray thought he perceived in the obliquity of the ambulacra an objection to the bilateral arrangement which I had observed in the Echinodermata; but this is merely one example more of the want of symmetry notwithstanding the similarity of the parts, as is found in most Mollusca. M. Wiegmann, in return, has very well observed, that their longitudinal diameter is shorter than the transversal. The species belonging to this genus are all recent.

E. atrata, Gr.—*E. acufera*, De Bl.—*E. carinata*, De Bl.—*E. Leschenaultii*, De Bl.—*E. lobata*, De Bl.—*E. Lucunter*, Gr.—*E. Mathæi*, De Bl.—*E. mammillata*, Gr.—*E. Maugei*, De Bl.—*E. oblonga*, De Bl.—*E. pedifera*, De Bl.—*E. Quoyii*, De Bl.—*E. trigonaria*, De Bl.

6. ARBACIA, Gray. (*Echinus*, auct.)—True *Echini*, similar to the *Diademæ*, but the tubercles are not perforated. Ambulacral spaces

narrow; ambulacra straight and simple, or each formed of two series of double pores. The fossil species are from the jura, chalk, and tertiary deposits. There are also some recent.

A. hieroglyphica, Ag. (Echi. hierogl., Goldf.)—*A. sulcata*, Ag. (E. sulc., Goldf.)—*A. nodulosa*, Ag. (E. nod., Munst.)—*A. granulosa*, Ag. (E. gran., Munst.)—*A. alutacea*, Ag. (E. alut., Goldf.)—*A. radiata*, Ag. (E. rad., Hæn.)—*A. pusilla*, Ag. (E. pusil., Munst.)—*A. punctulata*, Gr.—*A. pustulosa*, Gr.

7. ECHINUS, Linn. and Auct.—Ambulacra composed of segments of arcs formed by several pairs of pores, and converging uniformly towards the summit; disc circular or subangular, very regular. There are fossil species from the jura, chalk, and tertiary deposits, as also a great number of living ones.

E. germinans, Phil.—*E. perlatus*, Desm.—*E. lineatus*, Goldf.—*E. Menardi*, Desm.—*E. Milleri*, Desm.—*E. regalis*, Hæn.—*E. ventricosus*, Lam.—*E. scardicus*, Lam.—*E. pentagonus*, Lam.—*E. Peleolus*, Lam.—*E. variegatus*, Lam.—*E. esculentus*, Linn.—*E. vulgaris*, De Bl.—*E. lividus*, Lam.—*E. variolaris*, Lam.—*E. melo*, Lam.—*E. miliaris*, Lam., &c.

[To be continued.]

XXXV.—*Descriptions of British Chalcidites.* By FRANCIS WALKER, F.L.S.

INSECTA TETRAPTERA NECROMORPHA.

Class HYMENOPTERA.

Stirps Ichneumonina.

Order Chalcidites.

Genus *Cirrospilus*, Westwood.

Fem. Corpus lineare, angustum, sat longum, parum convexum, nitens, scitissime squameum, parce hirtum: caput transversum, breve, parvum, thorace angustius; vertex angustus; frons impressa abrupte declivis: oculi mediocres, subrotundi, extantes: ocelli vertice triangulum fingentes: antennæ clavatæ, corporis dimidio certe breviores; articulus 1^{us} validus, 3^{us} brevissimus, 4^{us} mediocris, 5^{us} brevior et latior; clava longiovata, apice acuminata; 5^o latior et plus duplo longior: thorax longiovatus: prothorax bene determinatus, subtrigonus, transversus, postice latus incurvus: mesothoracis scutum subquadratum, longitudine paullo latius, postice angustius, latera basi incurva; parapsidum suturæ vix conspicuæ; scutellum obconicum; postscutellum transversum, breve, lunatum, apud latera læve: metathorax transversus, sat bene determinatus: petiolus crassus, brevissimus: abdomen ovatum, depressum, subtus convexum, fere glabrum, thorace paullo brevius non latius; segmenta transversa, 1^{um} magnum læve micans, 2^{um} et sequentia ad 6^{um} breviora, subæqualia; pedes sat longi, graciles, subæquales; coxæ parvæ; femora subclavata; tibiæ rectæ; tarsis articulus 1^{us} brevis,